

Laois County Council

Date: 24/09/2019

c/o Darragh Carey Beng Bsc (Hons) MIEI
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Site Suitability Report for Planning permission for dwelling and proprietary treatment system at: Coolroe, Ballybrittas, Co. Laois.

The Proposed System:

Molloy Environmental Wastewater Secondary Treatment System (4 – 8 P.E.)

The proposed **Wastewater Treatment System** is EN 12566-3 certified by PIA & Molloy Klaro, is an SBR (Sequencing Batch Reactor) mechanical aeration system designed to cater for 4 – 8 P.E. (*population equivalent*), for **Klaro aerated Technology for SBRs**.

The secondary treatment system is inclusive, amongst others, of:

- Dual chambered pre-cast concrete tank for primary treatment (Primary tank).
- A single chamber pre-cast concrete tank for secondary treatment [Sequential Batch Reactor (SBR)] tank, (Ref: EPA, CoP, 2009, Fig 9.3, page 39).
- Delivery, installation and commissioning by employees of MOLLOY ENVIRONMENTAL.
- The Molloy Environmental Effluent Treatment System is fitted with a comprehensive PLC controller and alarm system. Alarming will occur with overloading or under-loading of the system and if there is a failure/ blockage of the pumps or aerator device. In addition, the system has a high water alarm system.
- The system uses an economy mode for energy conservation when inputs are low.

The primary, buffer and treatment tank is installed underground and will not give rise to any noticeable noise nuisance or any unpleasant odours once the system is correctly vented and maintained.

The system will be commissioned by Molloy Precast Products trained technicians.

A certificate of conformance will be issued by the commissioning technician, on the condition that the treatment system has been correctly installed and the relevant civil works have been correctly carried out. (Certification is confined to Molloy Precast Products installed equipment only.)

The recommended Service period for all Treatment Systems is a minimum of once per year.

Servicing is carried out by Molloy Precast Products Ltd. trained personnel.

The De-sludging frequency requirement will be identified by the service technician but will not be less than once per year.

Site Relevant Parameters

The report presents an opinion on the on-site percolation construction based on the percolation test results/relevant information supplied by **Antoinette Brennan at Laois County Council**. The assumptions, though reasonable, are given for guidance only and no liability can be accepted for changes in conditions not revealed by the percolation test results or by any other information provided. The recommendations in this report are based on the following parameters:

File Ref: 19-117 (DOM2084)

Report Date: 05/09/2019

Percolation values:	P: 25.56	T: 67.92
Water table:	n/a	
Bedrock:	n/a	
Proposed number of bedrooms:	3	which is equal to 5 P.E.
Required minimum constructed percolation area:	100m of 0.5m wide percolation trench.	

5PE/150lit/day = 750 lit. Dosing for $P > 50 \leq 75 = 3 \text{ lit/day/m}^2 = 250\text{m}^2$ Soil Polishing Filter percolation. Or 18.6m of trench/PE = 94m of trench. This calculation is per EPA Code of Practice (CoP) (2009), Wastewater Treatment and Disposal System Serving Single Houses (p.e. ≤ 10) - Table 10.1, p44

Refer to conditions indicated in the SCR by Laois County Council.

The location of the percolation area should be in accordance with the planning permission granted. Appendix A sets out details on the minimum separation distances in meters for the Molloy Effluent Treatment System and the percolation area.

Note: The soakaway for surface water drainage should be located down gradient of the percolation area or polishing filter and that this distance is maintained from neighbouring storm water disposal areas soakaways.

Aquifer category:	Rk	Vulnerability rating:	H	Vulnerability response:	R2^1
R2^1:					
<i>Acceptable subject to normal good practice. Where domestic water supplies are located nearby, particular attention should be given to the depth of subsoil over bedrock such that the minimum depths required in Section 6 are met and that the likelihood of microbial pollution is minimised.</i>					

Construction of the Trench Percolation System

- A generic drawing showing the layout for 100m of trenches, i.e. 10 of 10m trenches, none of which should exceed 10m, is attached for guidance in the construction of the percolation area.
- [Refer to EPA CoP 2009 Fig 7.3] Follow the layout shown on the site plan for the trench arrangement. [Refer to EPA CoP 2009 Fig 7.3 and to Laois County Council conditions in the SCR.
- The treated wastewater from the secondary treatment unit is pumped to a **Stilling Chamber** and then flows to a 3m distant distribution box and percolation pipes using typically 110mm over a 250-mm layer of gravel. The detail design should conform to best practice as outlined in design manuals. The loading rates should conform to those listed in EPA CoP 2009 (Section 10, Table 10.1, p. 44.).
- Dig the trenches 500 mm wide and no more than 850mm deep.
- Achieve a minimum separation distance between the trenches of 2-m spacing (2.5 m centre to centre).
- The maximum length of each trench should not exceed 10 m.
- The base of the trenches should be level.
- Use clean pebble stone (sized 15mm to 30mm) to fill the trench to a depth of ~250mm and form the 1:200 gradient for the pipes.
- The distribution box is to be kept perfectly level and positioned in the soil only, so that the surrounding area of the distribution box is free from the stones.
- In addition the connecting un-slit distribution pipes from the distribution box are also laid in soil free of the stones.
- These un-slit distribution pipes are in turn connected to the slit percolation pipes (see accompanying generic drawing for details).
- The slit pipes are laid on the stones in the trenches as indicated on the accompanying drawing. Ensure the pipes are at a gradient of no more than 1:200 away for the distribution manhole. Secure the distribution pipes with more stones until covered.
- After the installation is complete and backfilled the final adjustment of the weirs in the distribution can take place. It is essential to adjust the weirs proportionally to distribute the water evenly to each individual trench taking into account number of trenches fed by each outlet of the distribution box.
- The distribution pipes must be rigid, 100mm in diameter and 10 m in length, with perforations/slits positioned at 5 o'clock and 7 o'clock, spaced approximately 300 mm apart.
- Wastewater flows out through orifices in the percolation pipes into a gravel underlay, which acts both to distribute and provide a medium for initial treatment of the effluent. The effluent then percolates into the soil/subsoil, where it undergoes further biological, physical and chemical interactions that treat the contaminants.
- For effective treatment, the wastewater should enter the soil; if the base or walls of the percolation trench are compacted or glazed or otherwise damaged during excavation, they should be scratched with a steel tool such as a rake to expose the natural soil surface. It is equally important that the wastewater remains long enough in the soil; the hydraulic loading and the rate of flow into the sides and base of the trench control the residence time.
- Cover the stones with geotextile membrane or plastic sheet to prevent ingress of clay/silt etc. In turn, cover the membrane or sheet with 300 mm of soil. No deep rooting plants should be allowed to interfere with the distribution pipes of the percolation area.
- All rows must be ventilated at both ends i.e. the distribution manhole and the opposite end to the manhole. Join all trench end vents together, if necessary and locate the vent in a secure vandal proof area, preferably using a u- shaped down turned vent pipe.
- Soakaways for rain water and surface water should not be located in the vicinity of the treatment system or percolation area (min. 10 m), if possible.
- It is essential that the Molloy wastewater tanks are properly located on site so as to ensure no ingress of rain or surface water to the tanks. Tanks should not be installed on sites where the highest wet weather water table reaches more than 1.5m above the base of the tanks.
- If there is a high water table, precautions need to be taken so as to ensure that the tanks are anchored and sealed. It the client's responsibility to contact Molloy Precast Ltd for details of remedial action that may be required.
- Backfilling of the tanks should be done with soil. It is the responsibility of the client to ensure that risers are installed where required and manhole covers are properly sealed. Molloy Precast Products Ltd cannot take responsibility for incorrectly located tanks or deep installations that Molloy Precast Products Ltd has not recommended and failure to backfill appropriately.

- It is essential that the drainage contractor constructs the percolation area according to the recommendations cited in this report, or as indicated by the site engineer, Molloy Precast Products Ltd cannot take responsibility for incorrectly constructed percolation areas.
- See attached cross section generic drawing for recommended installation and percolation construction.
- Ventilation of the percolation area is necessary in order to ensure a permanent supply of fresh air for the percolation area to operate correctly.
- Refer to included details for specifications and operation of the treatment system.

Further recommendations are included in Appendix B to this letter.

Note: That these recommendations are only recommendations, as Molloy Precast Products Ltd do not assess materials or supervise the percolation construction they cannot be held responsible for incorrectly constructed or failed percolations. Notwithstanding the percolation test results, or the recommendations based on the percolation test results given above, it is essential that the client, or prospective site occupier, is fully satisfied that the position chosen on the site, and imported soil chosen for percolation, is capable of soaking away the full amount of treated water that the household will produce each day and that any imported soil is suitable for the percolation.

Visit Ireland's only percolation demonstration and training facility at Molloy Precast Products Ltd, Clara Road, Tullamore, Co. Offaly.

- See how to install your percolation area properly
- See full scale percolation areas with cross sections
- See every type of percolation system used in Ireland
- All percolation demonstrations are fully operational
- Avail of the expertise of our specialists in wastewater treatment

Please contact me should you require any additional information.

Yours sincerely,



Michael F. Cahill
Technical Manager
Wastewater Treatment Products

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Clara Road, Fax: +353 (0)57 93 26060 Web: www.molloyprecast.com
Tullamore,
Co. Offaly.

Molloy Environmental Systems is a trading name of Molloy Precast Products Ltd., a limited company registered in Ireland. Company No: 97677. Vat No: IE 4735884D

Maintenance Contract Agreement for Site ID TBA

Molloy Environmental Wastewater Treatment System for Single Houses

For: Laois County Council

At: Coolroe, Ballybrittas, Co. Laois.

Contact phone numbers: n/a

Molloy Precast Ltd undertakes to service the system as follows:

- Visual inspection and servicing off all components of the Molloy Environmental system
- Efficiency testing of the system on the following core parameters:
 - Sludge level in the primary settlement tank (to determine de-sludging frequency)
 - Sequential batch reactor (SBR) sludge volume check (Settled Sludge Volume – SSV30)
 - System test run through the control panel and check alarm log
 - Adjustment of system settings on the control panel where necessary
 - Issue a maintenance report of tests when completed

Annual charge: €210.00 per annum including VAT for one call.

Payable in advance. Renewable yearly. Call out charges are at our standard rates plus parts and mileage. Equipment under warranty is dependent on Molloy Precast Ltd servicing the system as advised. As a minimum the system should be serviced annually.

First Service Call due after:

Second Service call due after:

Optional Laboratory testing of effluent on request.

It is advisable to avoid excessive use of detergents and household cleaning agents and to use the phosphate free alternative products.

Disclaimer: Molloy Precast Ltd cannot take responsibility for the effluent quality as the treatment achieved will depend on household input, good system operation and maintenance. Molloy Precast Ltd cannot take responsibility for equipment damage owing to flooding/unfavourable site conditions.

Signed:	 _____	Signed:	_____
	Technical Manager (for MOLLOY PRECAST LTD)		(for Customer/Client)
Date:	<u>24/09/2019</u>	Date:	_____

(Prices Valid 2017 – VAT @ 13.5% - See Terms & Conditions)

[This contract is not valid until both the system and the service have been paid for in full.]

Maintenance Contract Terms & Conditions

- **Molloy Precast Products Ltd** trained service personnel will conduct the servicing of the designated Sewage Treatment System in a safe and efficient manner in accordance with Molloy Precast Products Ltd Safety Statement.
- The site Occupier/Owner will insure that the site is accessible and safe.
- This contract does not bind Molloy Precast Products Ltd to effluent quality, however every effort will be made to advise the occupier and to make any adjustments to the plant that will ensure the best possible effluent quality.
- The occupier should insure that all manholes pertaining to the sewage treatment system are accessible.
- Access to the control panel is also required. (If access to the control panel is not available at the time of a service call, the service will proceed without that component of the service.)
- Access to a water tap is needed to clean components during servicing.
- It is advisable that children and pets are not present in the vicinity of the sewage treatment tanks during servicing. (Open manholes present a significant risk of injury or drowning in the deep tanks.)
- The Service visit includes the items and visits that are paid for and indicated on the maintenance contract only.
- Replacement, broken or unserviceable parts will be charged for at cost.
- Breakdowns, alarms, etc. requiring **call out**, are subject to the charges below.
- Note: This maintenance contract only covers the treatment system. It does not extend to any fowl sewer pipe work or blockages or house fittings external to the treatment system. It does not cover any problems relating to percolation or soak-aways.
- A call out request, that occurs close to a due service call date, may be combined with the service by mutual agreement.

Failure to have the system serviced, on an annual basis, will invalidate any current warranty after the first 12 months of operation.

Call out costs are €100 per visit plus mileage @ €1.20 per mile from Tullamore and €40 per hour for every hour after the first hour, all plus VAT at 13.5%.

Access and mutually acceptable times must be arranged beforehand. No access at the time of an arranged call will incur the full callout charge.

Please mark the services required on the signed document and return to Molloy Precast with payment & VAT for the required services. The counter-signed document will be returned with a receipt.

(Prices Valid 2017 – VAT @ 13.5%)

Coleraine,
Clara Road,
Tullamore,
Co. Offaly.

Tel: +353 (0)57 93 26000
Fax: +353 (0)57 93 26060

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Web: www.molloyprecast.com

Appendix A: Minimum Separation Distances

The following table (EPA 2009 CoP, Section 6, Table 6.1, p14) below details the on the minimum separation distances in meters for the Molloy Environmental Effluent Treatment System and the percolation area. For minimum separation distances in meters for wells and for Ground Water Protection Response, refer to EPA, 2009 CoP, p. 57 - 62, 2009. In addition, for Heritage features (NHA/SAC), the distances required are dependent on the importance of the feature (contact Local Authorities or Dept. of the Environment and Local Government).

Table: 6.1 page 14 EPA CoP 2009 minimum separation distances in meters

System	Surface water soakaway	Water-course/stream	Open drain	Lake or foreshore	Dwelling	Site boundary	Trees	Road	Slope breaks
Molloy Environmental WWTS	5	10	10	50	7	3	3	4	4
Percolation area	5	10	10	50	10	3	3	4	4

Appendix B: Recommendations

According to the EPA's *Code of Practice (2009) - Wastewater Treatment and Disposal System Serving Single Houses (p.e. ≤10)* (Ref: EPA, CoP, 2009, Section 9.0, p.37) a packaged wastewater system uses mechanical parts (e.g. an aeration system) to treat wastewater from a dwelling house where a site is unsuitable for a conventional septic tank system. The resultant treated wastewater requires a polishing filter to allow for further treatment of the wastewater and to convey the treated wastewater to groundwater. The *polishing filter* should be designed in accordance with the procedures outlined in the EPA, CoP, 2009, *Section 10.1 p43*.

EPA, CoP, 2009: The mean influent concentration and minimum performance standards. [EPA CoP 2009 Table 5.1 p 9]

Characteristics	Typical mean influent concentration (mg/l) (p58)	On-site domestic treatment minimum effluent performance standards EPA CoP 2009 (p9)
B.O.D ₅	318	<20
C.O.D.	956	N.A.
Total Solids	200	<30
Ammonia (NH ₃ -N)	70	<20

A correctly constructed polishing filter will give final results as follows:

Characteristics	Prior to Treatment	Treated (SBR)	After Polishing Filter (percolation)
Ph	6-8	7 – 7.5	7
B.O.D ₅	>300	< 15	< 5
C.O.D.	>900	< 75	< 35
Total Solids	>200	< 30	< 4
Ammonia (NH ₃ -N)	>60	< 10	< 1

The achievement of these results is not guaranteed as the treatment achieved will depend on the system being properly operated and maintained.

MOLLOY PRECAST LTD fully guarantees the *Molloy Environmental Wastewater Treatment System* as suitable for the development in question when installed according to the manufacturer's specific instructions and commissioned by trained personnel. It is the responsibility of the client to ensure that the percolation area is construction properly in order for the system to operate. To ensure the efficient treatment and disposal of the domestic wastewater, we recommend the following:

- **NO RAINWATER, SURFACE WATER** etc. should be discharged to the treatment system or percolation area.
- Only domestic wastewater, which includes all effluent from the kitchen, toilets, bathroom, showers, appliances, should be discharged to the treatment system.

- A correctly vented percolation area must be constructed to facilitate effective filtration of the treated effluent into the subsoil.

Polishing Filters

The Molloy Environmental System (secondary treatment system) requires a polishing filter. According to the EPA's 2009 *Code of Practice (Section 8 and 10)* a soil filter system may be used in situations where difficult site conditions are encountered, such as a shallow water table, insufficient subsoil depth or insufficient percolation characteristics of native subsoil. A soil filter system may be developed through the use of imported soil with favorable characteristics or may be developed through the use of *in situ* soil where the upper layer has been removed and replaced by a gravel distribution layer or improved soil. These soils should have percolation values in the range of 3–75 for *in situ* material and a P/T-value of 3–30 for imported material. Effluent may be loaded onto a soil-polishing filter by any one of three arrangements (direct discharge, pumped discharge or gravity pipe discharge). All polishing filters should have a minimum thickness of 0.9m of free-draining unsaturated soil or sand between the point of infiltration of effluent and the water table and bedrock. However, greater depths/thicknesses may be required depending on the ground water protection responses¹. Polishing filters may be below, at ground surface or partially or totally above ground surface. It must be constructed to facilitate effective filtration of the treated effluent into the subsoil.

Sizing of the Polishing Filter

The size of the percolation area depends on the hydraulic loading rate and on the treatment that precedes the percolation area. The EPA's *Code of Practice (Section 10.1 Polishing Filters p. 43)*, recommends a shorter trench length of 10m for gravity fed systems for effluent from a secondary treatment system due to its high quality. This allows for effluent from a polishing filter to discharge to ground provide that the subsoil has a T-value <90 and a P-value between 3 and 75.

Type of Polishing Filter - Intermittent Soil Filter

Where the underlying subsoil are within the acceptable range of $3 \leq T \leq 75$, an intermittent soil filter (Ref: EPA CoP, Fig. 8.7, p31-32) may provide the required solution to the on-site treatment of wastewater. Furthermore, where soil ($10 < T < 30$) has to be imported, it should be placed in lifts in the proposed percolation area such that there is a minimum thickness of 0.9m of unsaturated permeable subsoil below the base of the polishing filter for secondary treatment systems i.e. minimum depth of unsaturated subsoil to bedrock and the water table (Ref: EPA, CoP, 2009, Table 6.2, p14). The fill should be placed in layers not exceeding 300-mm thick and lightly compacted. Care should be taken not to over-compact the soil as this will lead to ponding. After each lift is placed, percolation tests should be carried out.

In the case of a gravity system, it is recommended to pump the effluent to a stilling chamber from where the effluent flows by gravity to a distribution device (Ref: EPA, CoP, 2009, Section 11, p46-50). In this case, the length of gravity pipe from the stilling chamber to the box should be greater than 3m. Pumping to a sump/stilling chamber, which then discharges to a distribution device allows for even distribution of the effluent.

¹ (Ref: EPA CoP, Section 6 p14, Annex B)

Clarification to the design capacity requirements in Section 7 and Section 9 of the Code of Practice: Waste Water Treatment and Disposal Systems serving Single Houses (p.e. <10) (CoP).

All new domestic waste water treatment systems (including Septic Tanks) must now be tested in accordance with the requirements of EN 12566 and must satisfy the performance requirements as set out in the relevant National Annexes.

It is noted that the testing to the EN 12566:3 standard for packaged wastewater treatment systems is normally carried out by defining the hydraulic load input from which the organic test load is derived. As the test influent is within the range specified in Table 4.1 of the CoP the plant is deemed to have the capacity to deal with the 60g BOD/person load. The Nominal capacity, i.e. the maximum PE the plant is designed for, should therefore be defined by the hydraulic load as declared on the certificate divided by 150 litres and not by using the 60g BOD per person criteria.

Section 9 of the CoP does not specify the method to determine the design capacity for packaged wastewater treatment systems.

For the purposes of clarification and to ensure consistency across all types of domestic wastewater treatment systems (including septic tanks) the following method of calculating the design capacity suitable for the dwelling should be followed:

- For the purposes of the CoP the minimum house size is 2 bedrooms, which equates to a design capacity of 4 population equivalent (p.e.).
- For every additional bedroom, irrespective of size, an additional 1 p.e. should be added as per the table below.

No. of Bedrooms	Design Population Equivalent
Min of 2	4
3	5
4	6
5	7
6	8
7	9
8	10

NOTE: Bedroom size as referred to in Section 7.1.1 of the CoP is no longer a factor in determining the design capacity for septic tanks.

How can Aswaflow save you money?

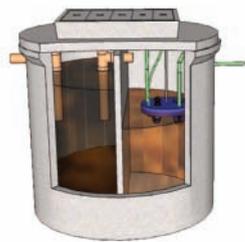
RUNNING COSTS AS LITTLE AS €60 PER YEAR!

Aswaflow uses Sequence Batch Reactor technology to treat wastewater to the minimum standards set out by the EPA. An SBR system only uses the minimum amount of energy required to treat the wastewater hence limiting electricity usage. When there is no demand on the system (eg holidays etc) it automatically goes into an eco-mode, only using enough energy to keep the bacteria alive.

The wastewater treatment system is separated into two chambers. Raw sewage enters the first chamber where it is stored while treatment is undergone in the second chamber. The first chamber also prevents any large solids from entering the second chamber. The second chamber treats the wastewater prior to discharge into the percolation system.

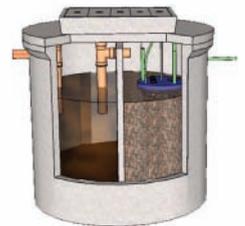
How the Aswaflow system works

1 Fill



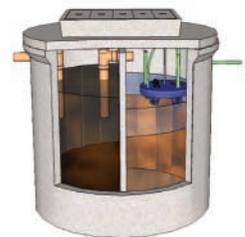
Wastewater is transferred from the first chamber into the second chamber via a siphon pipe primed by the sludge pump. An equal amount of wastewater is transferred every time. If the required amount is not available within the first chamber the next phase (React) will not commence until the quantity of wastewater is available.

2 React



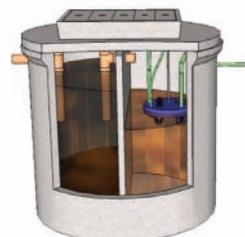
The AswaFlow system uses bacteria already in the chamber to degrade the impurities within sewage. This is achieved by agitating the contents of the tank to mix the sewage with the existing contents of the chamber. Oxygen is added using an aerator to allow this bacteria to thrive and efficiently remove the sewage's impurities. To prevent excessive amounts of sludge building up in the second chamber a small portion of sludge is intermittently pumped back to the first chamber using the sludge pump.

3 Settle



The React phase finishes after a set period of time, all equipment is then switched off allowing the sludge and bacteria within the tank to settle out. This produces a clarified volume of water on the top of the chamber.

4 Discharge



This phase removes the clarified volume of water. The clarified effluent is pumped to the percolation system using the clear water pump. The volume of water discharged is equal to the volume added in the fill phase and is dictated by a float switch.

TREATMENT PERFORMANCE RESULTS

Klaro GmbH
Spitzwegstraße 63, 95447 Bayreuth, Germany
EN 12566-3 Annex B
Results corresponding to EN 12566-3 and S.R. 66
PIA-SR66-1603-1032, shared itt
Small wastewater treatment system KLARO E (initial type test)
Sequential batch reactor in Molloy concrete tanks

Nominal organic daily load	0.39 kg/d		
Nominal hydraulic daily load	1.20 m ³ /d		
Treatment efficiency (nominal sequences)		Efficiency	Effluent
		COD	91.9 % 51 mg/l
		BOD ₅	95.9 % 12 mg/l
		NH ₄ -N	65.6 % 12 mg/l
		SS	94.4 % 20 mg/l
Number of desludging	Not more than once		
Electrical consumption	0.9 kWh/d		

Performance tested by:

PIA – Prüfinstitut für Abwassertechnik GmbH
(PIA GmbH)
Hergenrather Weg 30
52074 Aachen, Germany

This document replaces neither the declaration
of performance nor the CE marking.



Notified Body
No.: 1739



Certified according to
ISO 9001:2008



Prüfinstitut für Abwassertechnik GmbH
geprüft - tested - teste

Elmar Lancé

July 2016

TREATMENT PERFORMANCE RESULTS

Molloy Precast Products Ltd.
Coleraine, Clara Road, Tullamore, Co. Offaly, Ireland

EN 12566-3, Annex A, C
Results corresponding to EN 12566-3 and S.R. 66

PIA-SR66-1603-1032, shared itt

Molloy Precast Tanks
Concrete Tanks for SBR process in combination with
Klaro E treatment kit

Material	Concrete
Watertightness	Pass
Structural behaviour (vertical load test)	Pass (also wet conditions)
Durability	Pass

Performance tested by:

PIA – Prüfinstitut für Abwassertechnik GmbH
(PIA GmbH)
Hergenrather Weg 30
52074 Aachen, Germany

This document replaces neither the declaration
of performance nor the CE marking.



Notified Body
No.: 1739



Certified according to
ISO 9001:2008



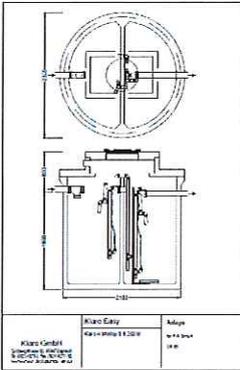
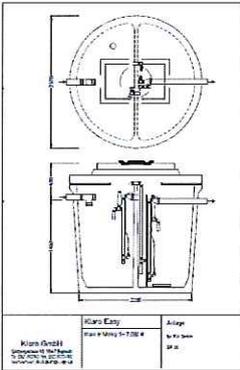
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Akkreditierungsstelle
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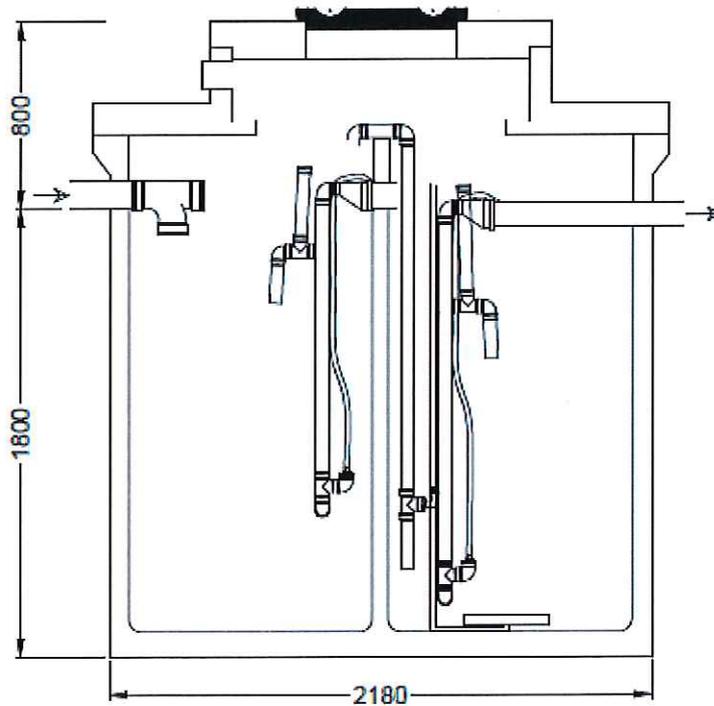
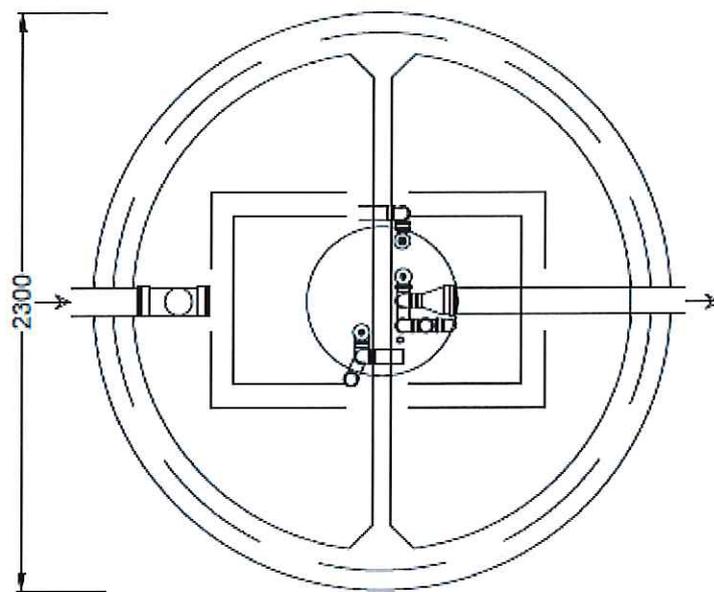
Prüfinstitut für Abwassertechnik GmbH
Elmar Lancé
geprüft - tested - teste

Elmar Lancé

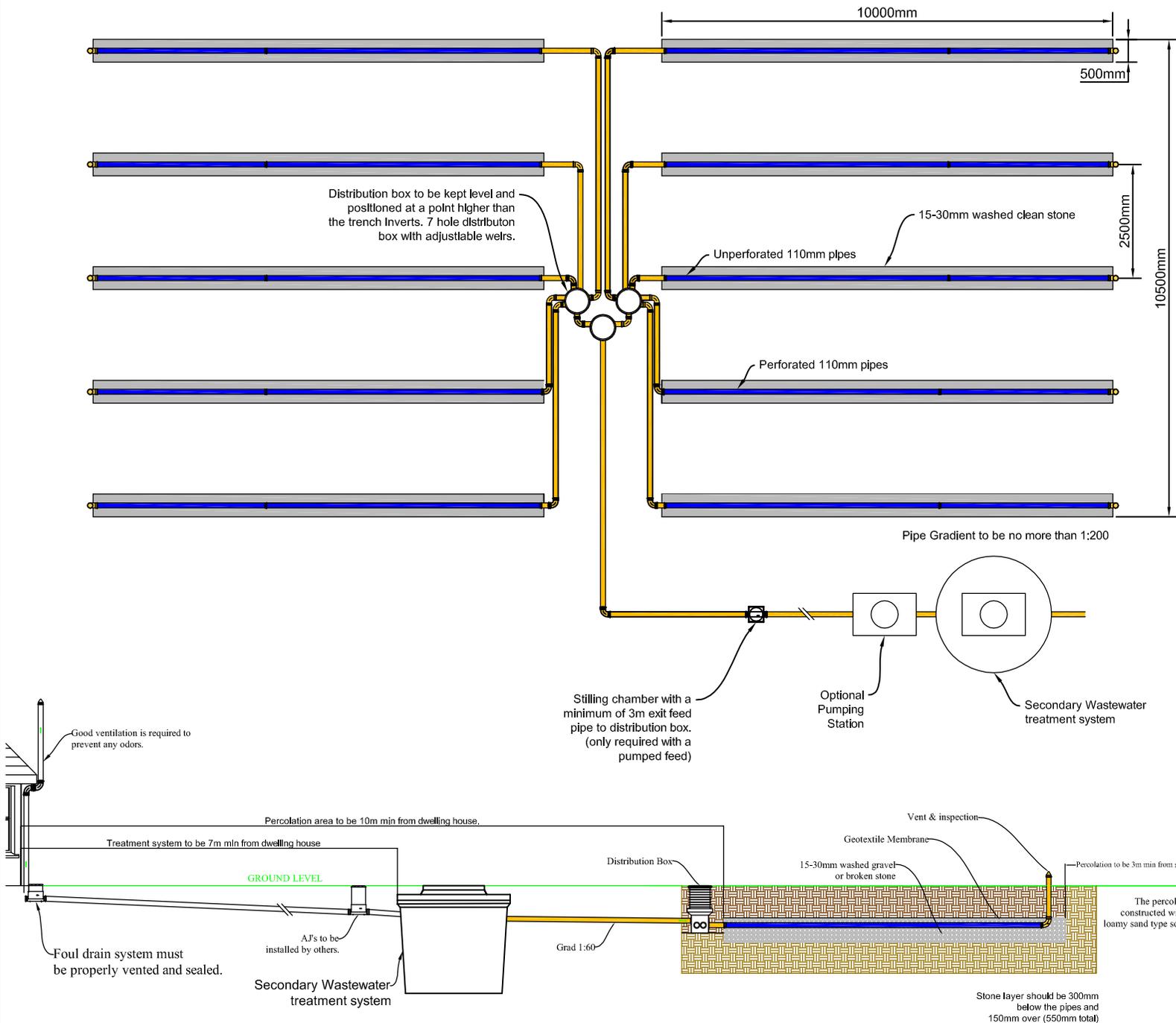
July 2016

KLARO E range shared ITT and its referring test reports:

Population equation (PE)	Drawing of model of the range	Watertightness (EN 12566-3 Annex A)	Treatment Efficiency (EN 12566-3 Annex B)	Structural Behaviour (EN 12566-3 Annex C)	Durability
Initial Type Test (ITT) 8	Not relevant	Not relevant	Pass PIA2007-020.e	Not relevant	Not relevant
Compared Tank 8		Pass PIA2012-WD/NC-1205-1035	Pass Shared ITT conformity check according to S.R. 66:2015	Pass For wet ground conditions also, 1.10 m installation depth from inlet invert	Pass PIA2016-DH-1603-1032.01
10		Pass PIA2012-WD/NC-1205-1035	Pass Range conformity according to S.R. 66:2015	Pass PIA2012-ST-BT-1205-1032 For wet ground conditions also, 1.10 m installation depth from inlet invert	Pass PIA2015-DH-1603-1032.01



<p>Klaro GmbH Spitzwegstrasse 63, 95447 Bayreuth Tel. (0921)16279-0 Fax. (0921)16279-100 www.klaro.eu</p>	<p>Klaro Easy</p>	<p>Anlage</p>
	<p>Klaro in Molloy S 6,200 lit</p>	<p>for PIA GmbH SR 66</p>



- Notes:**
- This drawing is ©. All rights reserved.
 - Do not scale from this drawing. Only for illustration purposes.
 - Specify any specific requirements prior to ordering. All civil works by customer.
 - Observe all safety regulations in regard to excavation and lifting requirements. Never leave opening uncovered or unattended at any time.
 - The depth of the infiltration surface is an important consideration in maintaining adequate subsoil aeration and frost protection in cold climates. The maximum depth should be limited, if possible, to no more than 1m below final graded surface to adequately reerate the soil and satisfy the daily oxygen demand of the applied wastewater. (EPA US 4.4.3)
 - Tanks must be positioned so that they are never the focus of surface water ingress.
 - For contoured sites with significant slopes, consult Molloy Environmental Systems, as the trenches should follow the contours and require special construction techniques to maintain even distribution.
 - Percolation design as per EPA CoP 2009.
 - Perforated Pipe - Blue
 - Unperforated Pipe Yellow

Minimum separation details
EPA 2009 CoP Table 6.1

	Tanks	Percolation
Water Course	10m	10m
Well	10m	15-60m
Lake	50m	50m
Boundary	3m	3m
Road	4m	4m
House	7m	10m

MOLLOY
ENVIRONMENTAL SYSTEMS

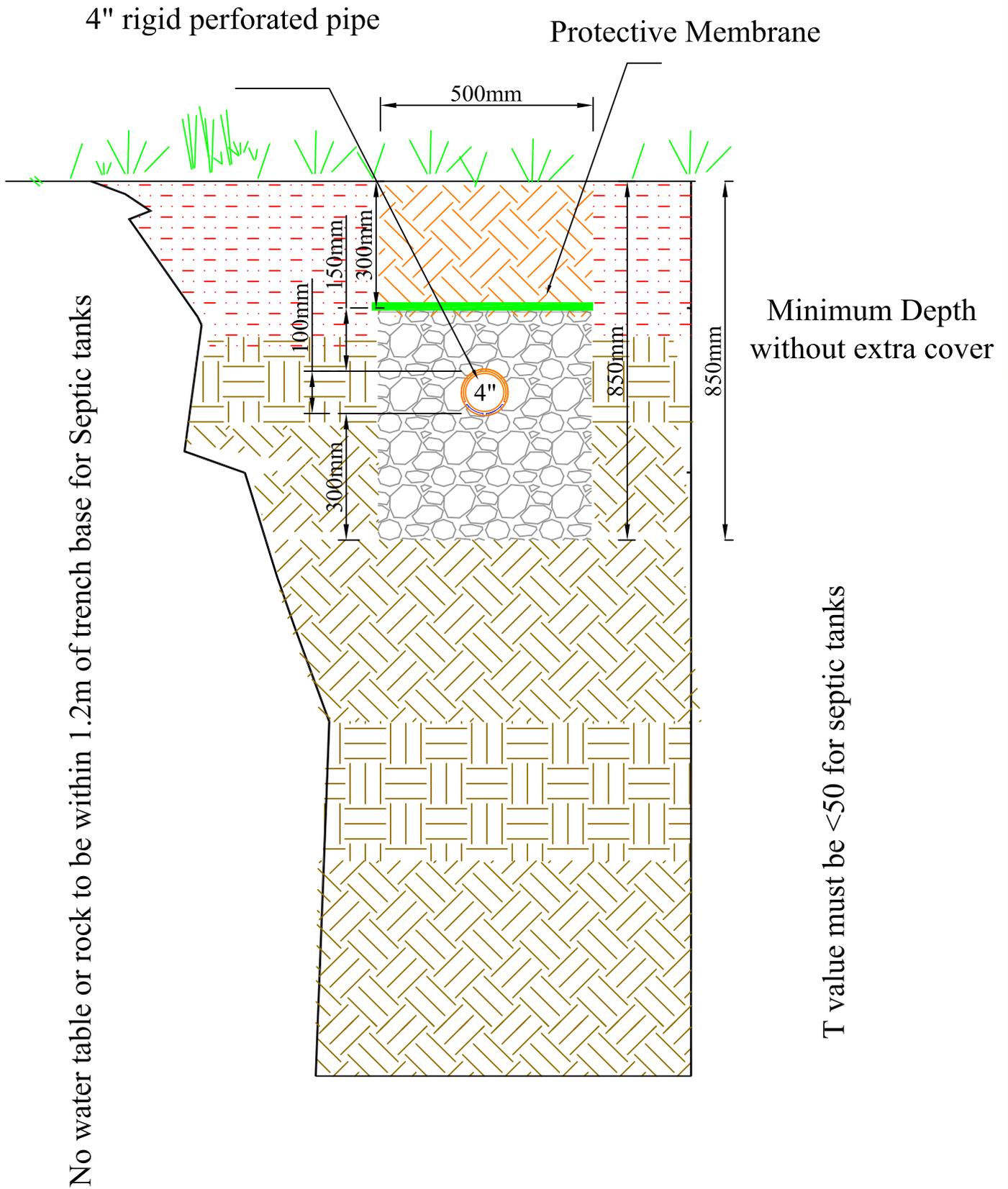
Clara Rd., Tullamore, Co. Offaly
T: 057 9326000 E: Info@molloyprecast.com
F: 057 9326060 W: www.molloyprecast.com

QUALITY: ISO 9001:2015 NSAI Certified
ENVIRONMENT: ISO 14001:2015 NSAI Certified
HEALTH & SAFETY: ISO 45001:2018 NSAI Certified

CIRI 2018/2019
ENGINEERS IRELAND

Title: 93m WWTS Tank Trench Percolation
PE: 8 PE @ PV <51 or 5 PE @ PV <76
Drq. no.: TP-WWTS-93-01-210219
Date: 21/02/2019
Drawn by: SF **Checked by:** KR

Standard Trench Section



Clara Road, Tullamore, Co. Offaly, Ireland
 Tel: 057 9326000 info@molloyprecast.com
 Fax: 057 9326060 www.molloyprecast.com

Note: Observe all safety regulations in regard to excavation and lifting requirements. Never leave opening uncovered or unattended at any time.
Note: Specify any specific requirements prior to ordering. All civil works by customer.
Note: Do not scale from this drawing. Only for illustration purposes.

Tank Type:	_____	Title:	_____
Tank Size:	_____	Date:	_____
Height:	_____	Dr. No.:	_____
Volume:	_____	Drawn By:	_____
Weight:	_____		
(Tank Dim: ± 20mm. Weight: ± 30Kg.)		This drawing is ©. All rights reserved.	

6.0 TREATMENT SYSTEM DETAILS

SYSTEM TYPE: Septic Tank System

Tank Capacity (m ³)	<input type="text"/>	Percolation Area		Mounded Percolation Area	
		No. of Trenches	<input type="text"/>	No. of Trenches	<input type="text"/>
		Length of Trenches (m)	<input type="text"/>	Length of Trenches (m)	<input type="text"/>
		Invert Level (m)	<input type="text"/>	Invert Level (m)	<input type="text"/>

SYSTEM TYPE: Secondary Treatment System

Filter Systems

Media Type	Area (m ²)*	Depth of Filter	Invert Level
Sand/Soil	<input type="text"/>	<input type="text"/>	<input type="text"/>
Soil	<input type="text"/>	<input type="text"/>	<input type="text"/>
Constructed Wetland	<input type="text"/>	<input type="text"/>	<input type="text"/>
Other	<input type="text"/>	<input type="text"/>	<input type="text"/>

Package Treatment Systems

Type	<input type="text"/>
Capacity PE	<input type="text"/>
Sizing of Primary Compartment	<input type="text"/> m ³

SYSTEM TYPE: Tertiary Treatment System

Polishing Filter: Surface Area (m ² *) <input type="text"/> or Gravity Fed: No. of Trenches <input type="text"/> Length of Trenches (m) <input type="text"/> Invert Level (m) <input type="text"/>	Package Treatment System: Capacity (pe) <input type="text"/> Constructed Wetland: Surface Area (m ² *) <input type="text"/>
---	---

DISCHARGE ROUTE:

Groundwater <input type="checkbox"/>	Hydraulic Loading Rate * (l/m ² .d) <input type="text"/>
Surface Water ** <input type="checkbox"/>	Discharge Rate (m ³ /hr) <input type="text"/>

TREATMENT STANDARDS:

Treatment System Performance Standard (mg/l)	BOD	SS	NH ₄ - N	Total N	Total P
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

QUALITY ASSURANCE:

Installation & Commissioning

On-going Maintenance

* Hydraulic loading rate is determined by the percolation rate of subsoil

** Water Pollution Act discharge licence required